

LEVEL 1 DOWNSTREAM ANALYSIS

Bristol Lane 9-Lot Plat

Tax Map #192605-9085

Prepared for

Northwest Equity Fund LLC

14216 97th Avenue NE

Kirkland, Washington, 98033

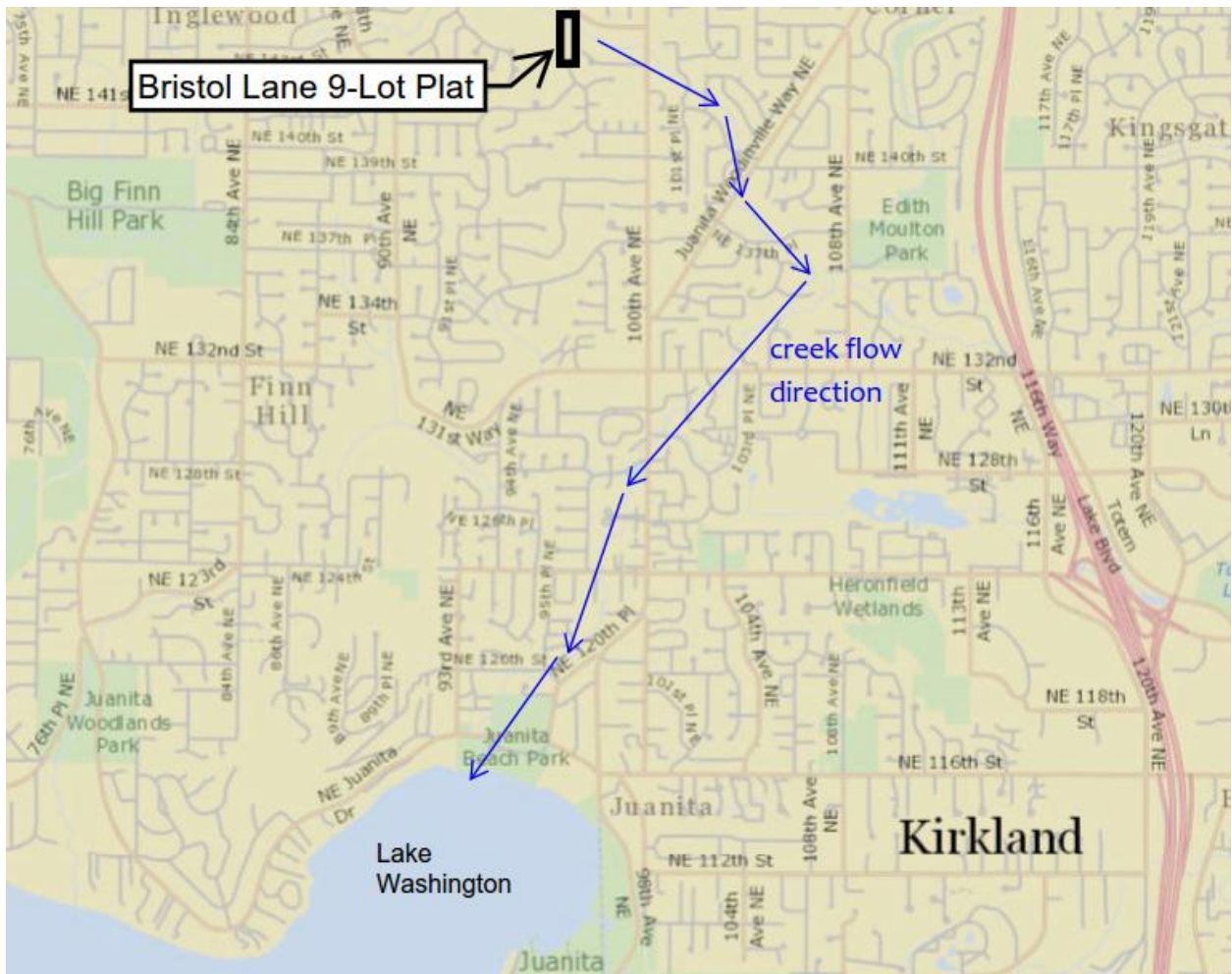
Prepared by

Stephenie Seawall

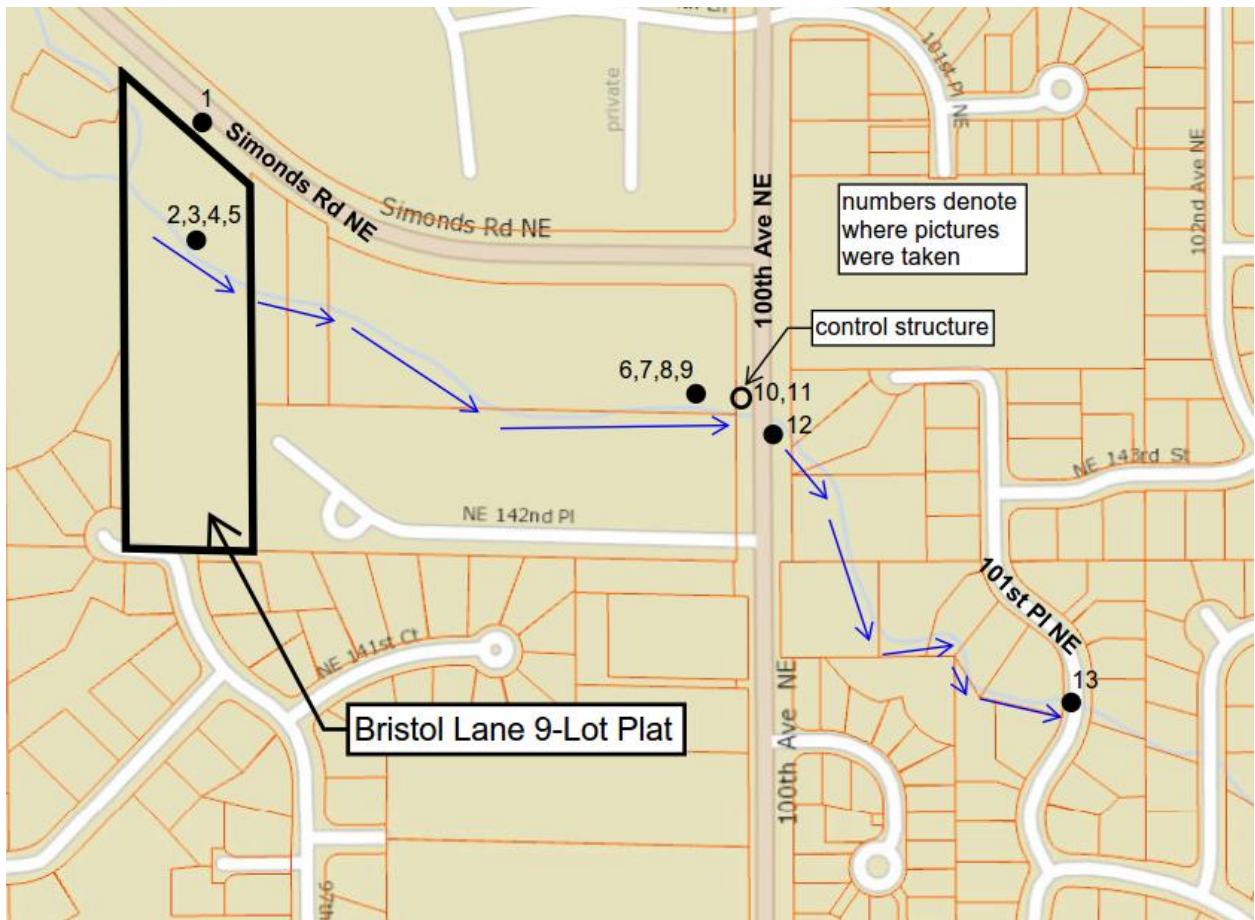
Duffy Ellis, PE

March 14, 2016

CES Job #1375



CIVIL ENGINEERING
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Executive Summary

Subject site and its associated downstream stormwater path for ¼ mile were inspected on January 11, 2016 by Stephenie Seawall. Bristol Lane falls within the Juanita Creek Drainage Basin. See several map exhibits in the back of this report which identify the site and stream path relative to various City and County GIS maps as background. The unnamed creek running thru site is a Class A stream with 75' buffer requirements. For reference, see the March 2016 Sensitive Areas Report by Wetland Resources for complete wetland and stream analysis.

The drainage stream was visually inspected as best as possible down to the 101st Place NE culvert crossing east of site. See pictures for reference. Several portions could not be walked due to private property restrictions.

In the developed condition, the mitigated stormwater from site (flow control from the on-site storage vault) will discharge into the stream near the western property line as shown on our preliminary engineering drawings. After leaving site, the stream flows southeast through private properties (which could not be walked) until it encounters 100th Ave NE where a control structure controls runoff rates before crossing under the road and

becomes open channel flow again. The unnamed stream joins Juanita Creek and empties into Lake Washington approximately 2 ½ miles south of the project site (as the creek flows).

In general terms, there appeared no indication of any significant erosion problems in the stream bed and channel for the portions that could be walked and inspected. The project will be required to size & install a Storm Detention Vault that is modelled and sized to level 2 standard. Level 2 is also known as Stream Protection Standard which mitigates storm duration events up to the 50 year storm. Given the condition of the stream in combination with the level 2 mitigation, the opinion of the undersigned is this development should not adversely impact the drainage channel (ie stream) in vicinity of the project.

See maps and pictures in the following pages for reference. Also see the Full TIR Drainage report also prepared for this project.

Task 1. Study area Definition and Maps

See maps attached.

Downstream Analysis

Task 2. Resource Review

"King County iMap" was primarily utilized to review for any sensitive areas and for basic drainage information for subject site. The King County iMap website notes this plat as an "environmentally sensitive area" and says that this is indicated on the title. "Erosion Hazard" is the reason, probably because of the steep slopes on-site. It is the opinion of CES that a review of items such as floodplain maps, other drainage studies, wetlands maps, etc. are deemed not relevant in this particular situation given this site is simply discharging into an existing creek. What is most important is identifying any downstream drainage problems that might be exacerbated by this project.

A look into "Drainage Complaints" on the King County iMap website was performed. Within ¼ mile downstream there were no complaints beyond fence damage since 1996 (besides a carpet and tire in the water). Between ¼ mile and ½ mile downstream there appears to have been some problems with minor bank erosion of this same creek in the 1990s and early 2000s.

A "Sensitive Area Determination" was performed in November 2015 by Wetland Resources, Inc. We have the report dated March 26, 2014. There are two "wetlands" delineated on this property. The first, Wetland A, is in the northwest corner of the property and receives a Type 2 wetland rating (Kirkland). The second, Wetland B, is adjacent to the stream and in the eastern portion of the site, and also receives a Type 2 rating (Kirkland). Both wetlands receive a 75 foot buffer. Three streams exist on this

property, Stream A is the main one. The other two, Streams B and C, feed into Stream A at the upstream side of the property. All three streams are considered "Class A" and receive a 75 foot buffer.

Downstream Analysis

Task 3. Field Inspection

Offsite-Upstream drainage Inspection

Three creeks (or streams) enter the northwestern corner of the plat, become one near the western property line, and this flows south/west until it exits on the east side.

Onsite Drainage Inspection

See pictures 1-5 for onsite stream bed.

Offsite--Downstream Drainage Inspection

Inspection was attempted for the ¼-mile path of the downstream storm system, but it was mostly a creek on various private properties. I was only able to access the creek, at a few locations, noted on the map on page 2. See map, pictures, and the comments attached to pictures for reference. Creek appeared in fine shape. No drainage problems downstream are anticipated.

See the following photos beginning on the following page for reference.

Picture 1: Standing at Simonds Road looking south at subject property (Bristol Lane Plat).



Picture 2: Onsite at Bristol Lane Plat. The Class A Stream (unnamed) at about midpoint of the width of the property. It is rainy season, raining, and there is a few inches of water in the creek at this area. It is flowing east (to the left, in the picture).



Picture 3: Again onsite at Bristol Lane looking upstream at the Class A Stream.



Picture 4: Bristol Lane Site. Standing in the same spot, looking downstream.



Picture 5: Standing at that same spot, looking north at the steep slope.



Picture 6: On the western side of 100th Ave NE, looking upstream.



Picture 7: West side of 100th Ave NE. near the control structure prior to crossing under 100th Ave NE. Some debris has accumulated.



Picture 8: Water flowing eastward into a control structure on eastern side of 100th Ave NE.



Picture 9: 100th Ave NE Crossing: Overflow Debris cage on top of Control Structure.



Picture 10: 100th Ave NE Crossing: Looking down into the upstream (incoming) side of the control structure.



Picture 11: 100th Ave NE Crossing: Looking down into the downstream (outgoing) side of the control structure.



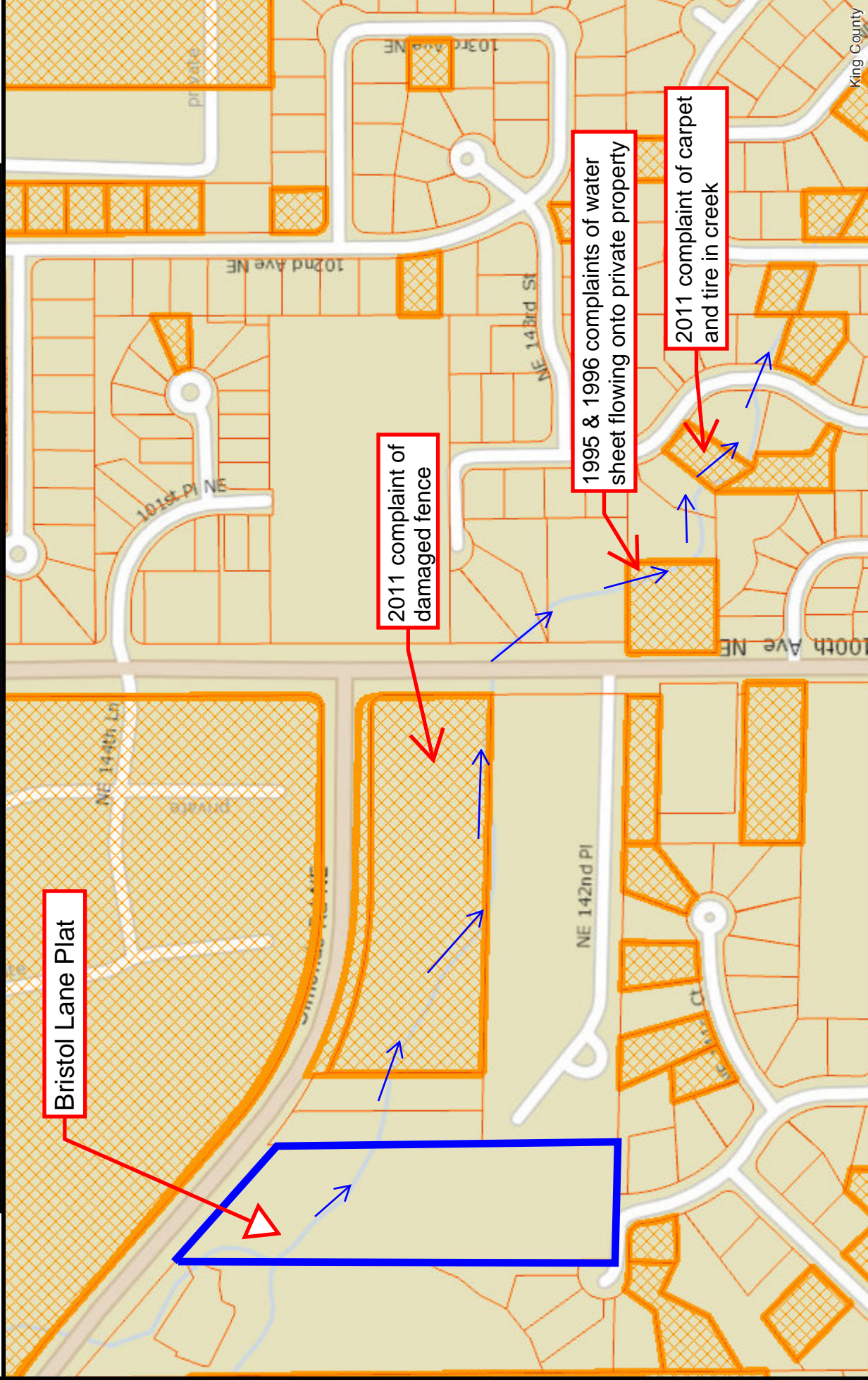
Picture 12: Crossing directly over 100th Ave NE, and looking down to the east.



Picture 13: After flowing through private property, the creek again reaches a place I can inspect it, at 101st Place NE. Looks great!



DRAINAGE COMPLAINTS MAP

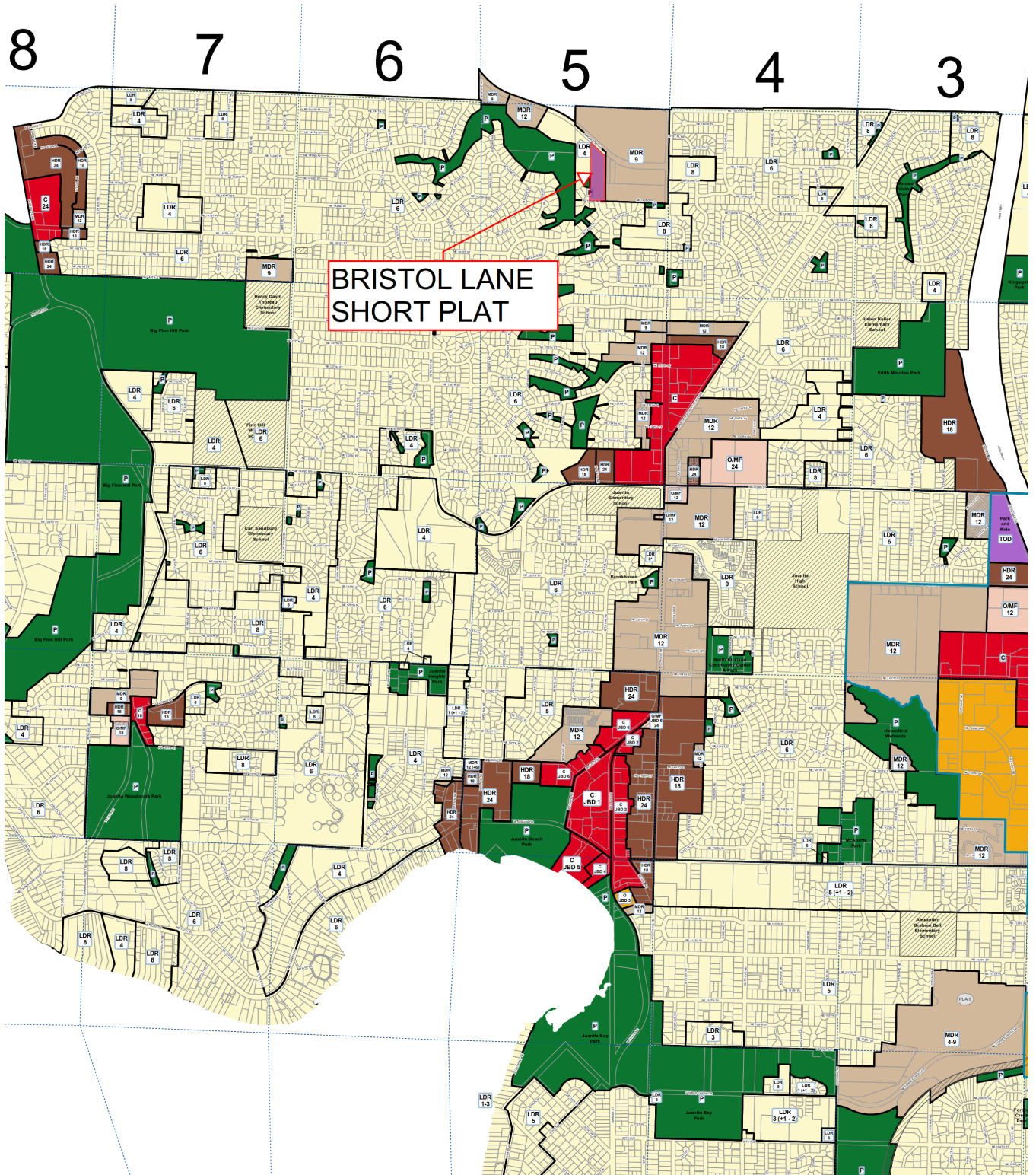


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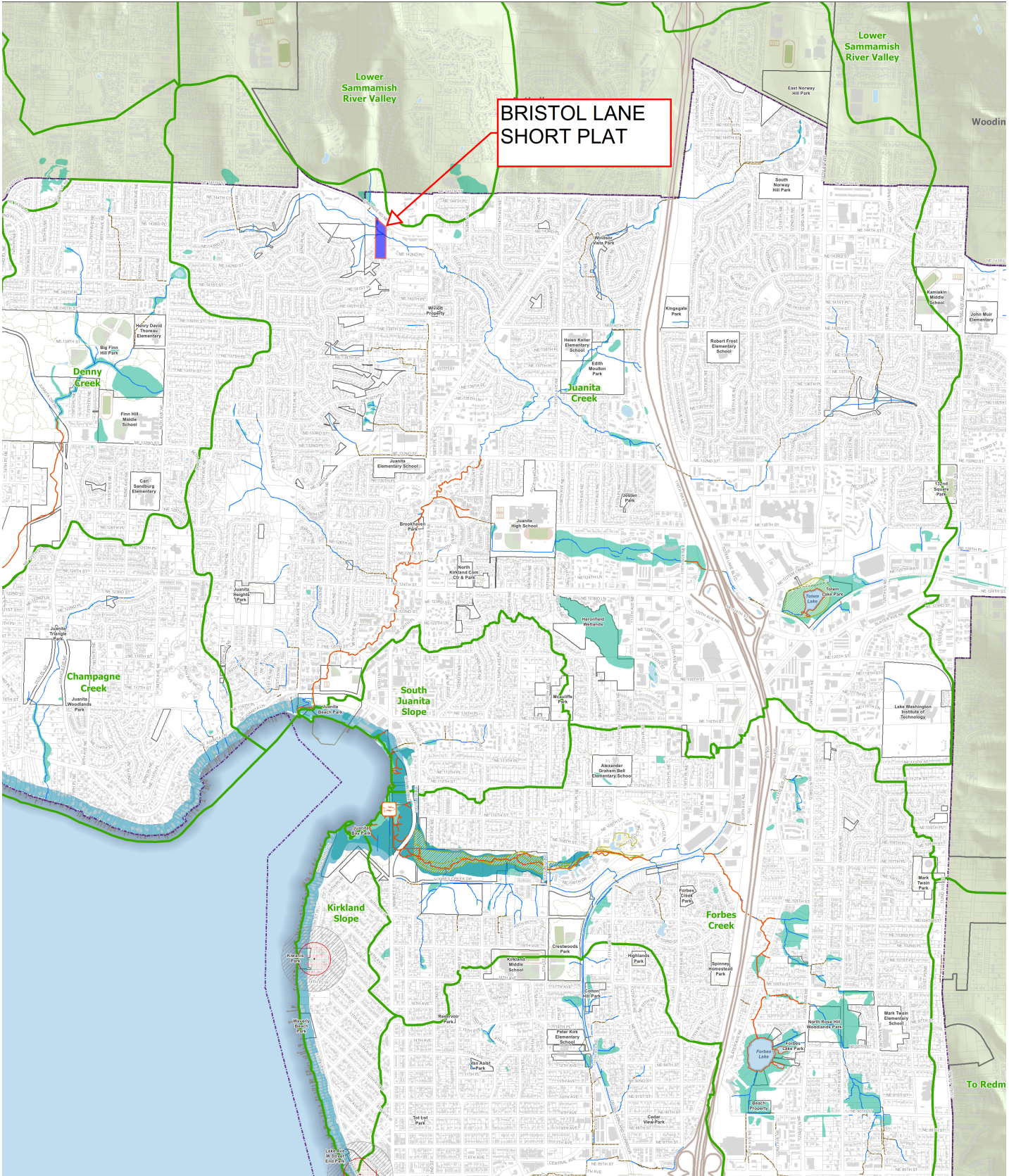
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Notes:

LAND USE MAP



SENSITIVE AREAS MAP



TOPOGRAPHIC MAP

